

Properties of Matter

5-4 The student will demonstrate an understanding of properties of matter. (Physical Science)

5-4.7 Illustrate the fact that when some substances are mixed together, they chemically combine to form a new substance that cannot be easily separated.

Taxonomy level: 2.2-B Understand Conceptual Knowledge

Previous/Future knowledge: Students have not been introduced to the concept of substances chemically combining in previous grades. In 7th grade, students will further develop this concept of chemical changes and reactions (7-5.9 and 7-5.10).

It is essential for students to know that under certain conditions, substances can chemically combine when they are mixed, and the new substance formed cannot easily be separated into the original components. When substances chemically combine, a new substance is formed that has different properties from the original substances that were mixed to form it.

Some examples in which new substances are formed might include:

- To make a cake, you can mix flour, water, egg, oil, and sugar, but after baking in the oven, the cake has different properties.
- Adding vinegar to baking soda will produce a gas. If the liquid is evaporated, a salt will remain.
- When steel wool is exposed to water, rust is formed.

It is not essential for students to know the conditions for a chemical change or reaction to occur.

Assessment Guidelines:

The objective of this indicator is to *illustrate* the fact that when some substances are mixed together, they chemically combine to form a new substance that cannot be easily separated; therefore, the primary focus of assessment should be to give or use illustrations such as pictures, diagrams, or word descriptions showing that a chemical change has occurred when substances were mixed together. However, appropriate assessments should also require students to *identify* substances that are chemically combined from a mixture because they cannot easily be separated; or *recognize* chemically combined mixtures as new substances that cannot easily be separated.